

Appl. No. 10/735,613
Amendment dated: October 31, 2007
Reply to OA of: September 11, 2007

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claims 1-13(canceled).

14(currently amended). A permanent magnet ring comprising a plurality of unit permanent magnets, each having a cylindrical shape, a flat shape, or a disc shape, a predetermined number of said unit permanent magnets being magnetically attracted to each other so as to be formed into a ring shape;

wherein each of said unit permanent magnets comprises a neodymium iron boron magnet core and a plated layer formed on the surface thereof;

wherein said each unit permanent magnet is a uniaxial anisotropic magnet in which an N pole or an S pole is formed on a first side surface of said uniaxial anisotropic magnet orthogonal to an easily magnetizing direction, while an S pole or an N pole is formed on a second side surface of said uniaxial anisotropic magnet opposite to said first side surface, said easily magnetizing direction is formed at a time of sintering a raw material of the neodymium iron boron magnet in a magnetic field, said N and S poles are magnetized along said easily magnetizing direction after sintering, and said first and second side surfaces are formed into curved surfaces;

wherein a predetermined number of said unit permanent magnets are magnetically attracted to each other in a line contact manner on the curved first and second side surfaces on which said N and S poles are formed by magnetizing along said easily magnetizing direction after sintering, and the S pole or the N pole is formed, thereby forming a ring shape having a predetermined size; [[and]]

wherein a magnetically attracting force on said N and S poles is strong and said unit permanent magnets are strongly connected with each other in a line contact

manner such that the ring shape can be kept as a whole because said unit permanent magnets are uniaxial anisotropic magnets; and

wherein a magnetic flux from the magnetic poles of each of said unit permanent uniaxial anisotropic magnets, which are magnetically attracted to each other in a line contact manner, forms a closed magnetic path along the circumference of the permanent magnet ring [[and]] so that the magnetic flux does not act directly on the area inside of the permanent magnet ring despite the strong magnetically attracting force, a leakage magnetic flux acts on the area inside of the permanent magnet ring and magnetic action caused by the leakage magnetic flux density is restrained to be weak as compared to the magnetic action caused by the magnetic flux from the magnetic poles forming the closed magnetic path and which are due to the uniaxial anisotropic nature of said unit permanent magnets.

15(currently amended). A permanent magnet ring comprising a plurality of unit permanent magnets, each having a spherical shape, a predetermined number of said unit permanent magnets being magnetically attracted to each other so as to be formed into a ring shape;

wherein each of said unit permanent magnets comprises a neodymium iron boron magnet core and a plated layer formed on the surface thereof;

wherein said each unit permanent magnet is a uniaxial anisotropic magnet in which an N pole or an S pole is formed on a side surface of said uniaxial anisotropic magnet orthogonal to an easily magnetizing direction, while an S pole or an N pole is formed on another side surface of said uniaxial anisotropic magnet opposite to said first side surface, said easily magnetizing direction is formed at a time of sintering a raw material of the neodymium iron boron magnet in a magnetic field, said N and S poles are magnetized along said easily magnetizing direction after sintering, and said first and second side surfaces are formed into curved surfaces;

wherein a predetermined number of said unit permanent magnets are magnetically attracted to each other in a point contact manner on the curved first and

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second side surfaces on which said N and S poles are formed by magnetizing along said easily magnetizing direction after sintering, and the S pole or the N pole is formed, thereby forming a ring shape having a predetermined size; [[and]]

wherein a magnetically attracting force on said N and S poles is strong and said unit permanent magnets are strongly connected with each other in a point contact manner such that the ring shape can be kept as a whole because said unit permanent magnets are uniaxial anisotropic magnets; and

wherein a magnetic flux from the magnetic poles of each of said unit permanent uniaxial anisotropic magnets, which are magnetically attracted to each other in a line contact manner, forms a closed magnetic path along the circumference of the permanent magnet ring [[and]] so that the magnetic flux does not act directly on the area inside of the permanent magnet ring despite the strong magnetically attracting force, a leakage magnetic flux acts on the area inside of the permanent magnet ring and magnetic action caused by the leakage magnetic flux density is restrained to be weak as compared to the magnetic action caused by the magnetic flux from the magnetic poles forming the closed magnetic path and which are due to the uniaxial anisotropic nature of said unit permanent magnets.

16(previously presented). A permanent magnet ring as claimed in any one of claims 14 or 15, wherein each of said unit permanent magnets further comprises a transparent siliceous coating layer formed over said plated layer formed on said neodymium iron boron magnet core.